UNITED STATES PATENT AND TRADEMARK OFFICE

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/699,360	10/31/2003	Eric S. Olson	TCOM0012	5403

39258 7590 02/07/2007 TENSORCOMM, INC. 1490 W. 121ST AVE., SUITE 202 WESTMINISTER, CO 80234	**EXAMINER** WARE, CICELY Q

ART UNIT	PAPER NUMBER
2611	

SHORTENED STATUTORY PERIOD OF RESPONSE	MAIL DATE	DELIVERY MODE
3 MONTHS	02/07/2007	PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

If NO period for reply is specified above, the maximum statutory period will apply and will expire 6 MONTHS from the mailing date of this communication.

	Application No.	**Applicant(s)**
Office Action Summary	10/699,360	OLSON ET AL.
	Examiner	**Art Unit**	
	Cicely Ware	2611	.

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE <u>3</u> MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.
- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
  Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *13 November 2006*.

2a)☐ This action is **FINAL**.   2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-32* is/are pending in the application.

    4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-9,12-21,24-29 and 32* is/are rejected.

7)☒ Claim(s) *10,11,22,23,30 and 31* is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *13 November 2006* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

    Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

    Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

    a)☐ All   b)☐ Some * c)☐ None of:

      1.☐ Certified copies of the priority documents have been received.

      2.☐ Certified copies of the priority documents have been received in Application No. _____.

      3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

    * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1)☒ Notice of References Cited (PTO-892)

2)☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)

3)☐ Information Disclosure Statement(s) (PTO/SB/08)
    Paper No(s)/Mail Date _____.

4)☐ Interview Summary (PTO-413)
    Paper No(s)/Mail Date. _____ .

5)☐ Notice of Informal Patent Application

6)☐ Other: _____.

DETAILED ACTION

Response to Arguments

1.   Applicant's arguments with respect to claims 1, 16, and 24 have been considered but are moot in view of the new ground(s) of rejection.

Upon further consideration of the application examiner asserts that Madhow et al. (US Patent 6,175,587) discloses the deficiencies explained by applicant for claims 1, 16 and 24 that Zehavi et al. does not disclose.

Examiner asserts that Madhow et al. discloses interference vectors that comprise spread Walsh codes (determined codes). An interference ranking circuit or system is used to determine the codes to be suppressed for each finger using an FHT matrix to develop the ranking procedure. The FHT matrix contains that traffic channels or signals for each finger. The interference observed by each finger is due to the spread Walsh code. The spread Walsh codes are the interference vectors that go into your FHT matrix, therefore examiner asserts that this is your Walsh matrix. Wherein ranking is used to selectively suppress certain signals in the FHT matrix with a certain level of energy or interference. A ranking list of interference is provided for each finger or signal, wherein the top five interference vectors may be selected to be reduced. The selected interference vectors are provided as codes to be suppressed. Madhow et al. explains that a spread Walsh code is a code that is determined or generated by multiplying the PN sequence by the given Walsh code, therefore the determined codes are your spread Walsh codes and wherein the spread Walsh codes are not constant from symbol to symbol therefore the interference vectors change every symbol.

Claim Rejections - 35 USC § 103

2.   The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all

obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

3.   Claims 1-4, 5, 6, 7, 16, 17, 19, 21, 24-26, 27, 29 are rejected under 35 U.S.C.

103(a) as being unpatentable over Zehavi et al. (US Patent 5,892,774), in view of

Madhow et al. (US Patent 6,175,587).

(1) With regard to claim 1, Zehavi et al. discloses in (Fig. 4 (154) and Fig. 5) a

receiver (Fig. 5 (90, 206)), comprising: a demodulator unit (208) configured for

determining a code from each of a plurality of signals and for demodulating one or more

of the plurality of signals (col. 7, lines 1-27, col. 8, lines 23-36).

However Zehavi et al. does not disclose a processing engine communicatively

coupled to the demodulator unit and configured for generating a matrix of one or more

vectors based on determined codes, wherein each element of the vectors comprises a

component of the determined codes and wherein the matrix is used to selectively

substantially reduce energy from one or more of the signals.

However Madhow et al. discloses in (Figs 3 and 4) a processing engine (400)

communicatively coupled to the demodulator unit (Fig. 2 (220)) and configured for

generating a matrix of one or more vectors based on determined codes (col. 7, lines 1-

5, 16-37, col. 8, lines 10-13), wherein each element of the vectors comprises a

component of the determined codes (col. 9, lines 31-67, col. 10, lines 1-6) and wherein

the matrix is used to selectively substantially reduce energy from one or more of the

signals (col. 6, lines 65-67, col. 7, lines 29-65, col. 8, lines 40-49, col. 9, lines 17-26, 31-

67, col. 10, lines 1-6, 8-13).

Therefore it would have been obvious to one of ordinary skill in the art to modify

Zehavi et al. in view of Madhow et al. to incorporate a processing engine

communicatively coupled to the demodulator unit and configured for generating a matrix

of one or more vectors based on determined codes, wherein each element of the

vectors comprises a component of the determined codes and wherein the matrix is used

to selectively substantially reduce energy from one or more of the signals to implement

interference suppression adaptively (Madhow et al., col. 2, lines 51-55).

(2) With regard to claim 2, claim 2 inherits all the limitations of claim 1. Zehavi et

al. further discloses in (Fig. 5) a searcher finger (206) configured for selecting signals for

demodulation (208) from said plurality of signals and for determining one or more codes

from selected signals (224, 226) (col. 7, lines 37-58).

(3) With regard to claim 3, claim 3 inherits all the limitations of claim 2. Zehavi et

al. further discloses in (Fig. 5) the demodulator unit (208) comprises a plurality of

demodulator fingers (206) configured for demodulating the selected signals.

(4) With regard to claim 4, claim 4 inherits all the limitations of claim 2. Madhow

et al. further discloses the determined codes comprise code offsets in time from one

another (col. 8, lines 40-54).

(5) With regard to claim 5, claim 5 inherits all the limitations of claim 1. Madhow

et al. further discloses wherein the matrix comprises one composite interference vector

having one or more elements, wherein each element of the vector includes a

component of a determined code and a relative amplitude of one of the signals

associated with the determined code (col. 9, lines 6-8, 46-61).

(6) With regard to claim 6, claim 6 inherits all the limitations of claim 1. Zehavi et

al. further discloses each vector of the matrix has one or more elements, each element

comprising a component of a determined code associated with one of the plurality of

signals (col. 7, lines 1-27).

(7) With regard to claim 7, claim 7 inherits all the limitations of claim 1. Madhow

et al. further discloses a radio frequency front end configured for receiving the signals

(col. 4, lines 26-31).

(8) With regard to claim 8, claim 8 inherits all the limitations of claim 7. Madhow

et al. further discloses in (Fig. 4 (402, 404)) wherein the processing engine comprises a

channel selector configured for selecting components of the determined codes from

signals selected for energy reduction (col. 7, lines 29-49, col. 8, lines 40-60).

(9) With regard to claim 9, claim 9 inherits all the limitations of claim 8. Madhow

et al. further discloses wherein the processing engine is further configured to generate a

cancellation operator used to substantially reduce the energy of the signals selected for

energy reduction (col. 7, lines 6-28, col. 8, lines 40-60, col. 10, lines 3-12).

(10) With regard to claim 16, see rejection of claim 1.

(11) With regard to claim 17, claim 17 inherits all the limitations of claim 16. See

rejection of claim 1.

(12) With regard to claim 18, claim 18 inherits all the limitations of claim 16.
Madhow et al. further discloses determining one or more codes for signals selected
from said plurality of signals (col. 9, lines 62-67, col. 10, lines 1-6, 8-13).

(13) With regard to claim 19, claim 19 inherits all the limitations of claim 16. See
rejection of claim 5.

(14) With regard to claim 20, claim 20 inherits all the limitations of claim 16.
Madhow et al. further discloses wherein generating comprises constructing the matrix
from a plurality of said one or more vectors, the matrix comprising a plurality of selected
vectors, wherein each of the plurality of selected vectors has one or more elements,
each of the one or more elements comprising a component of a determined code
associated with one of the plurality of signals (col. 8, lines 40-54, col. 9, lines 17-24).

(15) With regard to claim 21, claim 21 inherits all the limitations of claim 16. See
rejection of claim 9.

(16) With regard to claim 24, see rejection of claim 1.

(17) With regard to claim 25, claim 25 inherits all the limitations of claim 24. See
rejection of claim 3.

(18) With regard to claim 26, claim 26 inherits all the limitations of claim 24. See
rejection of claim 2.

(19) With regard to claim 27, claim 27 inherits all the limitations of claim 24. See
·rejection of claim 5.

(20) With regard to claim 28, claim 28 inherits all the limitations of claim 24. See
rejection of claim 20.

(21) With regard to claim 29, claim 29 inherits all the limitations of claim 24. See rejection of claim 9.

(22) With regard to claim 32, see rejection of claim 1.

4.   Claims 12 and 13 are rejected under 35 U.S.C. 103(a) as being unpatentable over Zehavi et al. (US Patent 5,892,774), in view of Madhow et al. (US Patent 6,175,587) as applied to claim 1, in view of Corbaton et al. (US Patent Application 2003/0072390).

(1) With regard to claim 12, claim 12 inherits all the limitations of claim 1. However Zehavi et al. in combination with Madhow et al. do not disclose the determined codes are selected from a group consisting of a spreading code and a covering code.

However Corbaton et al. discloses the determined codes are selected from a group consisting of a spreading code and a covering code (Pg. 4, col. 2, lines 1-9).

Therefore it would have been obvious to one of ordinary skill in the art to modify the inventions of Zehavi et al. in combination with Madhow et al. in view of Corbaton et al. to incorporate the determined codes are selected from a group consisting of a spreading code and a covering code in order to provide a more accurate C/I estimation for supporting variable data rate request schemes and turbo decoding (Corbaton et al., Pg. 1, col. 2, lines 24-28).

(2) With regard to claim 13, claim 13 inherits all the limitations of claim 12. Corbaton et al. further discloses the spreading code is a short code (Pg. 4, col. 2, lines 1-9).

5.   Claims 14 and 15 are rejected under 35 U.S.C. 103(a) as being unpatentable

over Zehavi et al. (US Patent 5,892,774), in view of Madhow et al. (US Patent

6,175,587) in view of Corbaton et al. (US Patent Application 2003/0072390) as applied

to claims 1 and 12, in further view of Butler et al. (US Patent Application 2002/0131479).

(1) With regard to claim 14, claim 14 inherits all the limitations of claim 12. Zehavi

et al. in combination Madhow et al. in combination with Corbaton et al. disclose all the

limitations of claim 12.

However Zehavi et al. in combination Madhow et al. in combination with

Corbaton et al. do not disclose wherein the covering code is selected from a group

consisting of a Walsh code and a quasi-orthogonal function code.

However Butler et al. discloses wherein the covering code is selected from a

group consisting of a Walsh code and a quasi-orthogonal function code (Pg. 1, col. 1,

lines 20-47, Pg. 6, col. 1, lines 1-5, 25-46).

Therefore it would have been obvious to one of ordinary skill in the art to modify

the inventions of Zehavi et al. in combination Madhow et al. in combination with

Corbaton et al. in view of Butler et al. to incorporate wherein the covering code is

selected from a group consisting of a Walsh code and a quasi orthogonal function code

in order to channelize data onto different code channels (Butler et al., Pg. 6, col. 1, lines

44-46).

(2) With regard to claim 15, claim 15 inherits all the limitations of claim 1. Butler

et al. further discloses the signals are selected from a group consisting of cdma2000

signals and cdmaOne signals (Pg. 1, col. 1, lines 20-47, Pg. 6, col. 1, lines 1-5, 25-46).

Allowable Subject Matter

6.   Claims 10, 11, 22, 23, 30, 31 are objected to as being dependent upon a rejected

base claim, but would be allowable if rewritten in independent form including all of the

limitations of the base claim and any intervening claims. The following is a statement of

reasons for the indication of allowable subject matter: The instant application discloses

a receiver with a processing engine reduces interference caused by unwanted signals

by mathematically reducing the energy of the signals. Prior art references show similar

methods but fail to teach: **"the cancellation operator comprises a projection**

operator P.sub.s.sup..perp. having the following form: P.sub.s.sup..perp.=I-

S(S.sup.TS).sup.-1S.sup.T, where I is an identity/matrix, S is the matrix and

S.sup.T is a transpose of the matrix", as in claims 10, 22, 30; **"wherein the**

processing engine comprises an application unit configured for applying the

projection operator P.sub.s.sup..perp. to a desired code x to selectively

substantially reduce one or more of the plurality of signals, wherein the

projection operator P.sub.s.sup..perp.is applied to the desired code according to

the following form: P.sub.s.sup..perp.x=(I-S(S.sup.TS).sup.-1S.sup.T)x", as in

claims 22, 23 and 31.

Conclusion

7.   Any inquiry concerning this communication or earlier communications from the examiner should be directed to Cicely Ware whose telephone number is 571-272-3047. The examiner can normally be reached on Monday – Friday, 8-5.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Mohammed Ghayour can be reached on 571-272-3021. The fax phone numbers for the organization where this application or proceeding is assigned are 703-872-9314 for regular communications and 703-872-9314 for After Final communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is 703-305-3900.

Cicely Ware

cqw
February 2, 2007

JAY K. PATEL
SUPERVISORY PATENT EXAMINER